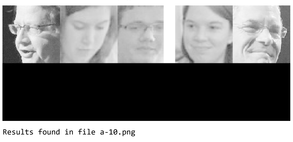
In [12]:
```
#import the necessary packages

from zipfile import ZipFile
from PIL import Image, ImageDraw
import pytesseract
import cv2 as cv
import numpy as np

#This function collects all the images that have been extracted
#from the zip file and save them in the file readonly.
#Also it creates images_list with some descriptive informations about each image
def collect_append_imgs(folder_path):
    images_list=[]
    with ZipFile(folder_path,'r') as pages:
        for img  in pages.infolist():
            with pages.open(img) as image:
                opened_image=Image.open(image)
                save_image=opened_image.save('readonly/'+img.filename)
                images_list.append({'name':img.filename, 'path':'readonly/'+img.filename,\
                                    'image':opened_image, 'faces_image':[]})
    return images_list


folder_path='readonly/small_img.zip'
folder_path2='readonly/images.zip'
images_list=collect_append_imgs(folder_path)
images_list2=collect_append_imgs(folder_path2)

#check weather images_lists has the correct information
#print(images_list)
#print(images_list2)


#text_detection function
def detect_text(images):
    for img in images:
        opened_image = Image.open(img['path'])
        text=pytesseract.image_to_string(opened_image)
        img['text']=text

#detect_faces function
def detect_faces(images):
    # loading the face detection classifier
    face_cascade = cv.CascadeClassifier('haarcascade_frontalface_default.xml')
    for img in images:
        image=cv.imread(img['path'])
        gray=cv.cvtColor(image,cv.COLOR_BGR2GRAY)
        faces=face_cascade.detectMultiScale(gray,1.3, 5)
        img['faces']=faces

#Creates faces_images with the faces

def create_faces(images):
    for img in images:
        for face in img['faces']:
            faces = img['image'].crop((face[0], face[1], \
                                       face[0] + face[2], face[1] + face[3]))

            faces = faces.resize((100, 100))
            img['faces_image'].append(faces)

#Call these functions that detects texts and faces from from small_img
detect_text(images_list)
detect_faces(images_list)
create_faces(images_list)

#make sure images_list is updated with a new information
#that includes faces and texts detected in each images
#print(images_list)

#use a sample keyword to find a string and display faces from images_list extracted from small_img zip file
search_text = 'Chris'

for img in images_list:
    if search_text in img['text']:
        print("Results found in file "+img['name'])
        if len(img['faces']) != 0:
            contact_sheet=Image.new('RGB', (500,200))
            x = 0
            y = 0
            for face in img['faces_image']:
                contact_sheet.paste(face,(x,y))
                x=x+100
                if x+face.width>contact_sheet.width:
                    x=0
                    y=y+100
        display(contact_sheet)


#Call these functions that detects texts and faces from the images_list2 extracted from images zip file
detect_text(images_list2)
detect_faces(images_list2)
create_faces(images_list2)

#use another sample keyword to find a string and display faces from images_list2
search_text2 = 'Mark'

for img in images_list2:
    if search_text2 in img['text']:
        print("Results found in file "+img['name'])
        if len(img['faces']) != 0:
            contact_sheet=Image.new('RGB', (500,200))
            x = 0
            y = 0
            for face in img['faces_image']:
                contact_sheet.paste(face,(x,y))
                x=x+100
                if x+face.width>contact_sheet.width:
                    x=0
                    y=y+100
        display(contact_sheet)
    else:
        print('But there were no faces in the file.')
```

```
Results found in file a-0.png
```

```
Results found in file a-3.png
```

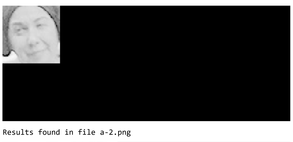
```
Results found in file a-0.png
```

```
Results found in file a-1.png
```

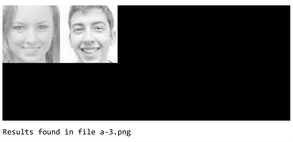


```
Results found in file a-10.png
```

```
But there were no faces in the file.
But there were no faces in the file.
Results found in file a-13.png
```

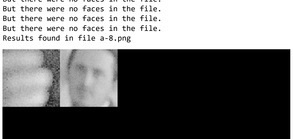


```
Results found in file a-2.png
```



```
Results found in file a-3.png
```

```
But there were no faces in the file.
But there were no faces in the file.
But there were no faces in the file.
But there were no faces in the file.
Results found in file a-8.png
```



```
But there were no faces in the file.
```